

minutes of the borrower of the more intelligent class; to whom, also, the most recent catalogue (and hence the indicator) is generally deficient of three-fourths of the books he most wants, viz. the new ones.

Nothing is better than the advice given here to secure a good librarian even at a higher cost than some may consider proportionate to the income. But the committee having taken that advice, there is little in this book which will be of value to either him or them. W. ODELL

Les Aérostats dirigeables. Par B. de Grilleau. (Paris : Dentu, 1884.)

THIS little book does not add anything to the scientific data regarding the direction of balloons which we have lately published; indeed it was written before the best and most conclusive trials were made. It is a popular view of the subject only; but it is useful as combating the ignorant prejudice existing thereon in the public mind. It points out to whom the successful solution of the problem is due; it states the results that have been obtained, and it shows what may be expected to be done in the future. It also explains clearly some of the conditions affecting the question, which are often misunderstood, such as the effect of the wind, the effective speed obtainable, the nature of the propelling action, and so on.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Clifford's "Mathematical Fragments"

A SHORT time since I lent the originals of this work to Mr. A. B. Kempe, F.R.S., as he has been working on the subject of "graphs." Some remarks he made on returning the "Fragments" led me to compare them with the lithographed work, and I propose to supply what is, I think, a defect in the published book.

The "Mathematical Fragments" are reproduced on xxii. pages of a *uniform* size which in the original manuscript is that of the first 5 pages only. The paper of these pages is blue, and has ruled lines. Page vi. corresponds to *two* pages of manuscript, indicated by a break, two other pages being blank. Page vii. corresponds to *two distinct* pages of manuscript. Page viii. is made up of three parts, the first six lines on one page of manuscript, the next thirteen of another page of manuscript. These last pages of plain white paper are approximately $4\frac{1}{2}$ inches wide by $5\frac{1}{2}$ inches deep. The page is filled up with a fragment on plain blue paper approximately $5\frac{1}{4}$ by 8 inches. Page ix. is on stout plain white paper, app. 7 inches by 9 inches. The last five lines of book are written on the back of the paper. Pages x.-xvi., xvii.-xxi. are written on thin white paper of the same material as page vi., size 9 inches by 11 inches; the pages are all *detached*; page 15 is on back of page 14, and page 19 on back of page 18. Page xx. is made up of two distinct pages of manuscript, the second commencing at the defaced word which is clearly in the manuscript "Degree." Page xvii. is written in pencil on stiff white paper, folded in half, the lower fragment in the manuscript being in the lower half of the page, and at right angles to the upper—size of full page, app. 7 inches by 10 inches. Page xxii. is made up of three pages of manuscript: the uppermost fragment is on white paper, 6 inches by 4 inches; the immediately following four lines of writing are given on the back of this page. The next three lines are on paper 7 inches by 10 inches, and the last four lines on precisely similar paper. The time notes at the side have, of course, nothing to do with "graphs."

These "Fragments" have been circulated (see "Papers," p. 286) chiefly amongst libraries; if the details I here supply are indicated in the copies, their value will, I believe, be greatly increased, and much trouble may be saved by students when

they know how slender a connection there is in some cases between consecutive pages of the text. In the manuscript there is no indication of the order in which the pages should be read beyond what I have pointed out above. The manuscripts are now deposited in the Library of University College, Gower Street.

R. TUCKER

The Upper Wind Currents in the South Indian Ocean and over the N.W. Monsoon

AFTER sending a brief account to NATURE of my observations on the upper wind currents over the Atlantic doldrums, I started from Natal for some journeys across various portions of the Indian Ocean, to investigate the circulation of the higher atmosphere in that region.

I first went to Mauritius. During the whole passage from Natal, at the end of December, we sailed in the S.E. Trade, with an almost constant movement of high cirrus from the N.W.

Though I was disappointed in not meeting with a cyclone in those seas, still I succeeded in obtaining much valuable information about the details of hurricane weather, which could only be learnt on the spot. One point relating to upper currents is very important. The cirrus which appears five or six days before the arrival of a hurricane follows the normal course from N.W. or S.W., and is no guide to the path of the cyclone. But on the outskirts of the hurricane, low clouds afford valuable information. If the cloud over the S.E. surface-wind inclines towards E. the centre of the cyclone will pass to the N.; if on the contrary the low cloud inclines towards S. the centre will pass to the S. of the observer.

Though Meldrum, and Bridet of Réunion, both agree on this point, the subject requires further elucidation, for such a rotation of upper currents is contrary to all analogy of what is supposed to hold round cyclones in the northern temperate regions. I am certain from my own investigations that the general character of tropical and extra-tropical cyclones is identical. In Mauritius hurricanes I find the same oval form, the same squall at the turn of the barometer, the same halo in front, and hard, detached cloud in rear, which characterise European cyclones. Mr. Harris has recently traced a cyclone from its easterly course as a typhoon in the China Seas, across the Pacific, United States, and Atlantic into Western Europe. Like every other long-lived cyclone, this one received accessions of strength by fusion or coalescence with others which had formed outside the tropics. It is perfectly certain that cyclones which revolved on different systems could not unite, and I think that the motion of the lower layers of cloud over the northern side of our own cyclones should receive special attention. At present we are led to believe that the cirrus in front of a cyclone, both right and left of the path, comes from S.W. or S.

Be this as it may, cloud motion forms a useful adjunct to a valuable and successful system of hurricane forecasting that is carried out by Mr. Meldrum, who, in the absence of telegraphs, has to rely entirely on his own instruments and above all on his own experience and judgment. Another interesting feature of this system is the care which must be taken to allow for the diurnal motion of the barometer during the slow diminution of pressure which always precedes the arrival of a hurricane.

From Mauritius I sailed to Adelaide, so as to examine the Polar limit of the S.E. Trade. Though we steered a great circle course which took us fully into 39° S. latitude, we experienced constant S.E. and E. winds. These must have been due to some extra-tropical anticyclone, and every observation of low or middle layers of cloud showed a current practically in the same direction as the surface-wind.

At Adelaide I learnt that the normal direction of the highest currents is from N.W. In that city the direction of the surface-wind is much influenced by land and sea breezes. Through the kindness of the acting chief of the Observatory, Mr. W. E. Cooke, I was able to confirm what I had previously suspected from my investigations in Melbourne last year, that sometimes at least the characteristic "southerly bursters" of Australia, are due to that class of V-shaped depression in which the rain occurs in rear of the disturbance. Other times the sudden interruption of S. wind appears due to the shift of wind at the passage of the trough of a cyclone.

From Adelaide I came here to Colombo so as to repeat a section of Indian Ocean very nearly at the same season and in the same straight line as last year. The results of the former voyage were communicated to NATURE, vol. xxxii. p. 624, when I announced the fact that the highest currents over the

N.W. monsoon came from points of E., and not from W., as might have been anticipated.

In this journey I found the clouds at the Polar side of the S.E. Trade coming constantly from a point either side of the surface-wind, that is, from S.S.E. to E.S.E. When well in the Trade, the middle clouds always came from some point more east than the surface-wind, or in accordance with the usual circulation of the southern hemisphere. No high cirrus was ever observed.

We found no doldrum, but ran straight from the Trade, under a bank of cloud, into the N.W. monsoon, in about 12° S. latitude. In that monsoon the low and middle clouds always came a little more from the N. than the surface N.W. wind, or in the manner of the upper winds of the northern hemisphere. All the high cirri moved from E. or N.E., except on one occasion, when they came from S.

The N.E. monsoon which we picked up on the equator was so clear that I only obtained one observation of cirrus which came from N.E. when the surface-wind was N.N.E. The lower layers of cloud usually drove from the same direction as the surface-wind, though on one or two occasions they came from a point more N. than the surface.

The above results entirely confirm the observations described in my previous letter of a deep S.E. Trade and of an easterly current over the N.W. monsoon.

RALPH ABERCROMBY

Colombo, February 15

Glacier Bay in Alaska

I THANK your correspondent, Mr. Chauncey Thomas, for pointing out my error in describing Glacier Bay as opening into Chilcoot Inlet, and for more exactly indicating its position. When I visited this region I was provided only with a small and inaccurate pocket-map, in which I found it difficult even to trace the course of the steamer, and I was under the impression that the whole of the fiord northward from Chatham Strait was known as Chilcoot Inlet, though my statement would still not be quite correct.

It may be well to add that my object in arranging my rough field-notes for publication was not to describe the glacier as a whole, but to draw attention to some uncompleted observation of special geological interest which it seemed to me ought to be made known as indications for future explorers; and it should be borne in mind that my estimates of heights and distances were only estimates based on opinion, and not on any system of actual measurement. The very limited time at my disposal, and my desire to get over as much ground as possible in that time, precluded the use of more satisfactory methods.

Bridlington Quay, March 13

G. W. LAMPLUGH

A Correction, and the Distribution of Appendicularia

(1) THE specimen which I referred to in NATURE (Jan. 7, p. 221) as being probably a new species of *Chetodermma*, has turned out on a more detailed examination not to be *Chetodermma* at all. Therefore I must withdraw the statement that that genus has been found in British seas.

(2) Can any of your readers who have been using the tow-net round our coasts give me information in regard to the occurrence of the Appendiculariidae? Forbes and McAndrew found *Appendicularia* off the north coast of Scotland in 1845. Allman found it in the Firth of Forth in 1858, and Sanders at Torquay, 1873; and it has been taken by Huxley on the English coast. It was seen in quantity by Sorby off the south coast of England a couple of summers ago, and I obtained it in Lamlash Bay in 1882 and 1884, in Loch Fyne in 1883, and off the Mann coast in 1885. Apparently it is much commoner and more generally distributed than is usually supposed. I would be glad to hear of any additional records of the occurrence of the Appendiculariidae in our seas.

W. A. HERDMAN

University College, Liverpool

Morley's "Organic Chemistry"—Correction

IN my notice of Dr. Morley's "Organic Chemistry" in this week's NATURE, the reference to "Ladenburg's synthetic optically-inactive coniine (α -isopropylpiperidine)" (p. 436) contains an inaccuracy. Instead of "coniine" it should read "coniine-base."

F. R. JAPP

Normal School of Science, March 11

"Peculiar Ice-Forms"

IN NATURE, vol. xxxi. p. 5, you allowed me to describe, under this heading, a curious and beautiful form of fibrous ice met with near Chamonix, which I, and other of your correspondents who discussed the matter, thought to be very unusual, though later communications seemed to show that it is commoner than we had supposed.

It may be interesting to note that a day or two ago I came upon the same form of ice in considerable quantity in a very unexpected locality, viz. on the path leading from Gerozano to Lake Nemi, in the Alban Hills. Attention was drawn to the circumstance by the crackling of the ice under foot, otherwise there was no visible indication of its presence except that, where it existed, the path was slightly damp (which was not the case on other parts of it), the dampness being evidently due to the partial melting of the upper stratum of the ice, which was everywhere covered with a layer of earth. The ice was almost exactly similar to that found at Chamonix, but only an inch and a half to two inches deep, and in three layers, easily detached from one another, and evidently the result of successive frosts.

We afterwards found that a bank beside the road between Albano and Frascati was covered with the same formation for several hundred yards; but it would certainly have escaped detection, being everywhere covered with earth, if our previous discovery had not led us to recognise it. This proves that it may often exist unnoticed.

The conditions were precisely similar to those under which this particular form of ice has been observed before—viz. a northerly aspect—a very porous soil (in this case volcanic), bright, sunny days, and clear nights with a low temperature.

Rome, March 12

B. WOOD SMITH

REMARKABLE DISCOVERY OF RARE METALS IN DILUVIAL CLAYS¹

DR. STROHECKER, of Frankfort, has carefully examined and analysed the clay which is found in the neighbourhood of Hainstadt, near Seiligenstadt, and he has made the remarkable discovery that this clay, which has been largely used for building purposes, contains considerable quantities of some of the rare metals, and more especially cerium. The beds are extensive, and consist of layers differing considerably in appearance and composition.

The composition of picked samples of the two upper layers is as follows:—

	No. 1	No. 2a
SiO ₂ ...	47.5444	58.3331
TiO ₂ ...	trace	—
Al ₂ O ₃ ...	24.5937	11.7607
BeO ...	6.4399	5.3833
Fe ₂ O ₃ ...	0.9190	0.6356
Ce ₂ (OH) ₆ ...	13.4214	9.4012
DiO ...	—	0.8474
LaO ...	0.8576	2.6536
YO ...	—	1.6949
MgO ...	1.5901	1.8659
CaCO ₃ ...	0.8878	—
CaSO ₄ ...	0.1361	0.2015
CaO ...	—	0.5883
P ₂ O ₅ ...	trace	2.0691
K ₂ O ...	2.3236	0.5648
Na ₂ O ...	1.2137	0.5838
NH ₄ Cl ...	—	0.0529
Loss on ignition ...	—	4.1057
	99.9273	100.7418

The cerium and yttrium oxides appear to be derived from orthite, which is known to occur in the syenite at Weinheim. The upper layer (No. 1) of the clay varies in colour from a bright flesh-colour to a dark cinnamon-brown, indicating that the cerium hydroxide, which is the colouring substance, varies in amount at different points. The bricks made from this clay vary in colour according to the temperature at which they are burnt, the lightly-burnt bricks having an orange-yellow colour, whilst those

¹ *Journal f. prakt. Chemie*, 1886, pp. 132 and 260.